From Payment Access to Economic Capability: Digital Transactions for Viksit Bharat 2047

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Abstract

India's digital-payment transformation is one of the world's largest experiments in population-scale digital public infrastructure. The next phase, aligned with the national aspiration of Viksit Bharat 2047, must move beyond transaction counts toward broad-based economic capability. This article develops a policy framework connecting digital transactions to productivity, formalisation, financial inclusion, state capacity, and household resilience. It combines descriptive evidence from official sources with a structured review of research on digital finance and public infrastructure. In FY2024-25, India recorded 228.31 billion digital-payment transactions, while the Unified Payments Interface (UPI) alone processed 23.66 billion transactions in July 2026. Scale, however, is not equivalent to development. Persistent divides in device access, connectivity, literacy, gender, geography, merchant economics, cybersecurity, privacy, and grievance redress can weaken welfare gains. The paper therefore proposes a four-stage pathway universal access, trusted usage, productive integration, and global interoperability supported by measurable 2030, 2035, and 2047 outcomes. Its central argument is that digital payments should be governed as essential economic infrastructure: open and interoperable, but also resilient, contestable, privacy-preserving, accessible offline and in Indian languages, and accountable to users. This shift from "more digital" to "better digital" is necessary for payment innovation to contribute credibly to a developed, inclusive, and resilient India by 2047.

Keywords: Viksit Bharat 2047; digital payments; UPI; digital public infrastructure; financial inclusion; fintech; India Stack; cybersecurity.

JEL codes: E42, G21, G23, O33, O38.

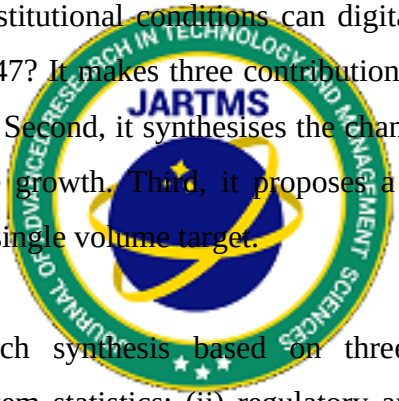
1 Introduction

India enters the period to 2047 with a distinctive institutional asset: a population-scale digital public infrastructure (DPI) comprising identity, payments, data exchange, and public-service

rails. Aadhaar, basic bank accounts under the Pradhan Mantri Jan-Dhan Yojana (PMJDY), mobile connectivity, UPI, Aadhaar Enabled Payment System (AePS), Bharat Bill Payment System, FASTag, and consent-based data-sharing mechanisms have reduced the time and monetary cost of many transactions [12, 17, 26, 29]. The architecture has combined public rule-setting and shared rails with regulated private innovation.

The growth is exceptional. Total digital-payment volume rose from 20.71 billion transactions in FY2017-18 to 228.31 billion in FY2024-25, a reported compound annual growth rate of about 41 percent [15]. In July 2026, UPI processed 23.66 billion transactions worth approximately Rs. 29.88 trillion through 741 live banks [18]. Yet high aggregate volume does not settle the development question. A payment may be convenient without creating savings, credit access, productivity, consumer power, or resilience. It may also transfer risks—fraud, surveillance, exclusion, outages, or market concentration—to households and small firms.

This article asks: under what institutional conditions can digital transactions make a sustained contribution to Viksit Bharat 2047? It makes three contributions. First, it distinguishes payment scale from developmental value. Second, it synthesises the channels, constraints, and safeguards linking transactions to inclusive growth. Third, it proposes a staged roadmap with outcome-oriented indicators rather than a single volume target.



2 Scope and Method

The article is a policy-research synthesis based on three evidence layers: (i) official administrative and payment-system statistics; (ii) regulatory and strategy documents; and (iii) peer-reviewed and multilateral research on financial inclusion, digital finance, identity, and welfare delivery. Sources were selected for institutional authority, methodological transparency, and relevance to India. Statistics are reported as available up to 6 August 2026.

The analysis is descriptive and institutional; it does not claim that payment growth alone caused macroeconomic growth or poverty reduction. Evidence from particular programmes is used to identify plausible mechanisms and design conditions. The organising framework treats developmental value as:

$$V = A \times U \times T \times P - (F + E + S + C) \quad (1)$$

where A denotes effective access, U meaningful usage, T trust, and P productive integration. The deductions are losses from fraud (F), exclusion (E), systemic or operational fragility (S), and excessive concentration or rent extraction (C). The multiplicative form captures a core

proposition: if access, usage, trust, or productive connection approaches zero for a group, aggregate scale can coexist with little developmental value for that group.

3 Literature Review and Conceptual Foundations

The literature relevant to India's payment transition spans financial inclusion, transaction-cost economics, digital public infrastructure, state capacity, platform competition, and consumer protection. A first strand examines whether access to accounts and payment instruments changes household welfare. Global Findex evidence distinguishes account ownership from use and resilience, showing why an inclusion strategy must examine saving, borrowing, receiving wages or transfers, and the ability to meet emergency expenses rather than treating account opening as the final outcome [8]. Studies of Kenya's mobile-money system provide unusually strong evidence that lower remittance frictions can improve informal risk sharing and that sustained access can affect poverty and occupational choice, especially for women [14, 28]. Reviews nevertheless caution that effects vary with agent networks, market structure, product design, regulation, and the surrounding financial system [2]. The appropriate lesson for India is therefore mechanism-based: cheaper and more reliable transfers can expand household options, but the magnitude and distribution of gains must be established in the Indian context.

A second strand concerns digital identity and government capability. Reliable identification can reduce duplication and enable portable access to services, while biometric or digital authentication can lower some administrative costs [13]. Experimental evidence from biometric smartcards in Andhra Pradesh found faster and more predictable benefit payments with reduced leakage, demonstrating that administrative technology can strengthen implementation when delivery institutions function well [16]. Other evidence documents authentication failure, transaction costs imposed on beneficiaries, and exclusion in food-security delivery [11]. Taken together, these studies reject both technological determinism and blanket pessimism. The effects of a digital system depend on error rates, local capacity, fallback arrangements, accountability, and the value placed on the time and dignity of users.

A third strand studies infrastructure and innovation. India's model uses shared population-scale components upon which public and private providers can build services. Analyses of India Stack emphasise modularity, open interfaces, interoperability, and the separation of foundational capabilities from application-level competition [12, 17]. The G20 and

World Bank describe DPI as reusable systems that can support inclusion and productivity when accompanied by appropriate governance [29, 30]. Reusability can lower fixed costs and accelerate innovation; however, a shared rail also becomes a critical dependency. The same architecture that creates positive network effects can amplify outages, cyber incidents, or governance failures. Openness must therefore be paired with operational resilience, privacy, and contestability.

A fourth strand concerns data and credit. Payment histories may reduce information asymmetry for borrowers with limited collateral or conventional credit files. India's Account Aggregator framework seeks to make financial-data sharing consent-based and portable, while digital-lending rules allocate responsibilities to regulated entities [1, 24]. Transaction data, however, are an imperfect representation of productive potential. Cash-intensive or seasonal firms can appear weak; household and business flows can be mixed; and historical inequalities can enter automated models through proxy variables. Developmental use of payment data consequently requires data quality, purpose limitation, explainability, human review, and a practical right to contest adverse decisions.

The synthesis suggests a distinction among four levels of digital-payment development:

1. Access: a person can reach an account, instrument, network, and acceptance point at reasonable cost.
2. Effective use: the person can complete relevant transactions independently, reliably, and with informed consent.
3. Financial capability: use improves control over money, resilience, savings, suitable credit, and the ability to resolve problems.
4. Developmental transformation: firms and institutions convert lower transaction costs and better information into productivity, formalisation, innovation, and improved public services.

Movement between these levels is not automatic. This layered interpretation provides the conceptual basis for the outcome dashboard and staged roadmap developed below.

4 India's Digital-Payment Baseline

UPI's interoperable, instant, account-to-account design has made low-value digital payments broadly usable. Its open interface reduces bilateral integration costs, QR acceptance lowers merchant hardware requirements, and real-time confirmation improves the cash-flow position of

small firms. Complementary systems serve remittances, government transfers, bill payments, tolls, recurring mandates, and assisted or biometric transactions [25-27].

This baseline reveals three structural strengths. First, interoperability creates network effects without requiring consumers and merchants to use the same bank or application. Second, the public-infrastructure approach separates core rails from competitive customer-facing services. Third, near-zero marginal transaction costs make frequent, low-ticket payments viable. It also reveals three measurement traps: transaction volume is not the number of included people; bank-account ownership is not active, informed use; and payment value is not value added to the economy.

Table 1: Selected indicators of India's digital-payment transition

Indicator	**Observation**	**Interpretation / Caution**
All digital-payment volume	20.71 billion (FY2017-18); 228.31 billion (FY2024-25)	Rapid diffusion; volume includes heterogeneous instruments and use cases.
All digital-payment value	Rs. 1,962 trillion (FY2017-18); Rs. 3,509 trillion (FY2024-25)	Value grows more slowly than volume as small retail payments digitise.
UPI, July 2026	23.66 billion transactions; Rs. 29.88 trillion; 741 banks live	Very high frequency and broad institutional participation; not a unique-user count.
RBI Digital Payments Index	Composite index covering enablers, infrastructure, performance, demand, and consumer centricity	Better than volume alone, but distributional outcomes require separate measures.
Financial-inclusion strategy	NSFI 2025-30 emphasizes equitable, responsible, suitable, affordable services, literacy, DPI, and protection	Establishes a policy bridge from access to financial well-being.

5 Scenario Framework for 2047

Long-range point forecasts for payment volume would create false precision. Population, nominal income, technology, regulation, consumer preferences, and the boundary between payment and other financial services will all change before 2047. A more useful approach is to compare institutional scenarios. The scenarios in Table 2 are not predictions; they are internally consistent pathways designed to reveal policy choices and early-warning indicators.

The first scenario demonstrates why transaction growth is an insufficient objective. Users may transact digitally because alternatives have disappeared rather than because the service is trusted. Merchants may accept payments while receiving little value beyond settlement, and concentration may create single points of failure. Under the second scenario, national averages improve but benefits cluster among connected regions, skilled consumers, and formal firms. This pathway is plausible if India solves infrastructure scale but gives insufficient attention to last-mile capability and institutional quality.

Table 2: Alternative digital-payment pathways to 2047

Dimension	Scale without trust	Uneven transformation	Capability-centred ecosystem
Access	High headline coverage; persistent device, language, disability, and rural gaps	Broad access, but service quality varies by region and income	Universal, channel-neutral access with assisted and offline options
Consumer outcome	Frequent use alongside fraud anxiety and weak redress; vulnerable groups bear disproportionate losses	Convenience for most; persistent friction for vulnerable groups	Informed use, rapid recourse, low loss rates, and meaningful user control
MSME outcome	Digital receipts grow but credit and productivity gains remain limited	Better services for formal and data-rich firms	Portable records support bookkeeping, suitable finance, and low-burden formalization
Market	Application and	Interoperable core, but	Contestable services,

structure & governance	infrastructure concentration increases	uneven bargaining power and innovation	transparent pricing, portability, and resilient shared rails
Data	Expansive collection and opaque profiling	Legal compliance with variable implementation quality	Data minimization, auditable consent, purpose limitation, and effective contest rights
Macro outcome	Efficiency gains offset by exclusion, fraud, outages, and distrust	Moderate productivity gains concentrated in leading sectors	Broad productivity, state-capacity, resilience, and inclusion gains

The capability-centred scenario is the normative objective of this paper. It does not require the elimination of cash. Cash can remain an important resilience, privacy, and inclusion instrument even in a highly digital economy. Instead, the objective is genuine choice among safe and efficient channels. Progress toward this scenario can be assessed through leading indicators: active use gaps between demographic groups; end-to-end success and latency; complaint resolution and restitution time; fraud loss relative to transaction value; merchant retention; concentration at application, acquiring, cloud, and switching layers; and the proportion of MSMEs that can export and selectively share usable transaction records.

For evaluation, each indicator should report both a national level and a distribution. An average success rate can conceal severe failure in a district or at a small bank. A median complaint time can conceal a long tail of unresolved cases. Gender-disaggregated account data can conceal whether women control the device and credentials. Accordingly, official reporting should include percentiles, failure tails, repeat complaints, rural-urban and state variation, and results for accessible and assisted channels. Targets should be reviewed periodically as technology and risks evolve rather than fixed mechanically for two decades.

6 How Digital Transactions Can Support Viksit Bharat

6.1 Lower transaction costs and higher productivity

Digital payments reduce travel, queuing, cash handling, reconciliation, and settlement delays. For micro, small, and medium enterprises (MSMEs), machine-readable receipts can improve

bookkeeping, inventory decisions, and verification of cash flow. When combined with consent-based data sharing, such records may reduce information asymmetry in credit assessment. The benefit is not automatic: thin or noisy data can produce unfair automated decisions, and firms may remain credit constrained when lenders lack risk appetite or suitable products [1, 4, 24].

6.2 Inclusion, resilience, and agency

Global evidence shows substantial gains in account ownership over the past decade, while also documenting gaps in usage, device ownership, and financial resilience [8]. Research on mobile money outside India finds that well-designed digital finance can improve risk sharing and, over time, support poverty reduction and occupational change [2, 14, 28]. These findings establish plausible mechanisms, not directly transferable effect sizes for India. India's assisted channels, basic accounts, and direct-benefit-transfer architecture can lower access barriers, but dependable cash-in/cash-out, informed consent, and accessible recourse remain essential [13, 16, 20].

Digital access can strengthen women's control over transfers and reduce dependence on intermediaries. Conversely, shared phones, lower digital literacy, social norms, and limited control over credentials can reproduce household inequalities. Policy should therefore measure who controls and confidently uses an account, not only whose name appears on it [8, 31].

6.3 Formalization and capable government

Digital trails can simplify tax compliance, invoicing, procurement, and benefit administration. They can also improve auditability and reduce certain leakages. Evidence from Aadhaar-linked benefit delivery indicates both fiscal and user-side gains in some settings and exclusion risks in others, illustrating why authentication performance and exception handling must be evaluated locally [11, 16]. Formalisation should be induced by useful services and proportionate compliance, not by making small firms' participation punitive.

6.4 Innovation and internationalisation

Reusable rails lower entry barriers for new products, and cross-border linkage can make remittances and trade settlement faster and cheaper. India's experience is increasingly relevant to countries building identity, payment, and data-exchange systems [30, 32]. Internationalisation should prioritise interoperability, transparent foreign-exchange pricing, anti-money-laundering safeguards, and reciprocal governance rather than simply exporting a brand. Central bank digital currency experiments may complement existing rails in selected use cases, but require a clear

problem statement and careful attention to privacy, bank intermediation, offline capability, and cyber resilience [3, 23].

7 Binding Constraints and Emerging Risks

7.1 The access-quality divide

Connectivity coverage does not ensure reliable bandwidth, affordable data, smartphone ownership, electricity, accessible interfaces, or confidence. Older persons, persons with disabilities, migrants, remote communities, and speakers of less-supported languages face different barriers. A universal system must support feature phones, voice and assisted modes, offline authorisation for bounded values, and a reliable cash interface during a long transition. RBI's financial-inclusion strategies correctly connect access with literacy, suitability, and protection [20, 27].

7.2 Fraud, social engineering, and weak recourse

As technical authentication improves, attackers increasingly manipulate users through impersonation, remote-access applications, deceptive requests, and compromised credentials. The policy objective cannot be "zero reported fraud," which may encourage under-reporting. It should be lower loss per transaction, rapid detection and freezing, clear allocation of liability, fast provisional credit in eligible cases, interoperable complaint tracking, and public reporting of resolution times. RBI's online dispute-resolution framework provides a foundation, but user experience across banks, apps, telecom networks, police, and the cybercrime portal must become seamless [21, 26].

7.3 Privacy and data governance

Payment metadata can reveal location, relationships, health, religion, and consumption patterns. The Digital Personal Data Protection Act, 2023 and finalized Rules, 2025 create a general legal framework, but high-frequency financial data also requires purpose limitation, data minimisation, auditable consent, strong security, short retention where appropriate, and restrictions on manipulative profiling [9, 10]. Privacy-enhancing technologies and tiered disclosure should be built into infrastructure rather than added after deployment.

7.4 Concentration and sustainability

Network effects may concentrate transaction initiation among a small number of applications even when the underlying rail is interoperable. Concentration can create correlated operational risk, bargaining power over merchants and banks, and dependency on a few technical stacks. At

the same time, a permanently ambiguous revenue model can weaken investment in fraud control, service quality, and acceptance. Public policy should protect low-cost basic payments while permitting transparent, competitive remuneration for value-added services. Portability, non-discriminatory access, open technical standards, exit planning, and regular competition assessment are preferable to either unregulated dominance or administratively frozen economics [5, 7, 25].

7.5 Operational and systemic resilience

At national scale, payments are critical infrastructure. A software defect, telecom outage, cloud failure, cyberattack, or settlement bottleneck can disrupt commerce. Resilience therefore requires multi-region redundancy, tested fallback modes, realistic recovery-time objectives, incident disclosure, capacity headroom, and periodic system-wide exercises involving banks, non-banks, telecom operators, cloud providers, and public agencies. International principles for financial-market infrastructure remain relevant even as retail systems acquire new architectures [6, 19].

8 A Four-Stage Roadmap to 2047

8.1 Stage I: Universal and usable access (2026-2030)

The immediate task is to close the quality-of-access gap. Government and industry should make low-cost accounts active; expand reliable rural and last-mile connectivity; require accessible, multilingual, low-literacy design; strengthen business correspondents; and scale secure offline and feature-phone payments. Every digital channel should have a tested non-digital or assisted exception process. Public dashboards should disaggregate active usage, failure rates, fraud losses, complaints, and resolution by gender, age, disability, geography, and channel where privacy-safe measurement is possible.

8.2 Stage II: Trusted and resilient usage (2030-2035)

The second stage should treat trust as infrastructure. A single user-facing dispute reference should travel across banks, payment applications, telecom providers, and enforcement agencies. Standardised liability rules, 24-hour reporting, risk-based cooling periods, behavioural warnings, confirmation-of-payee controls, and rapid fund tracing should be evaluated against published outcomes. Independent audits should cover uptime, algorithmic risk models, accessibility, data minimization, and third-party dependencies.

8.3 Stage III: Productive integration (2035-2040)

Payments should connect voluntarily to bookkeeping, invoices, logistics, tax, insurance, savings, and appropriately underwritten credit. MSMEs should retain portable, machine-readable records and choose when to share them. Public policy should reward formalisation with simpler compliance and useful services. Credit decisions based on transaction data should be explainable, contestable, monitored for disparate outcomes, and prohibited from using irrelevant sensitive proxies.

8.4 Stage IV: Global, green, and adaptive infrastructure (2040-2047)

By 2047 India should provide safe, low-cost domestic payments as a near-universal utility and support interoperable cross-border payments for migrants, tourists, and firms. Infrastructure procurement should consider energy efficiency and lifecycle emissions. Cryptographic agility, post-quantum migration plans, privacy-preserving analytics, and continuous red-team exercises should keep long-lived public rails adaptable. International partnerships should be based on open standards, local institutional ownership, and shared governance.

Table 3: Proposed outcome dashboard for digital transactions

Domain	2030/2035 direction	2047 end-state
Inclusion	Measure active, independent use; close gender, rural, disability, age, and language gaps	Near-universal ability to make and receive safe payments through a channel suited to the user
Reliability	Publish end-to-end success, latency, downtime, and recovery metrics by major participant	Critical-payment availability with tested offline and cross-provider fallback
Safety	Reduce fraud loss per million transactions; publish median complaint and refund times	Real-time collaborative fraud defence with rapid, fair, auditable restitution
Competition	Monitor app, acquiring, infrastructure, and data-layer concentration; ensure portability	Contestable service layer over interoperable rails with credible entry and exit
Productivity	Increase consenting MSMEs using portable payment records for accounts and suitable finance	Transactions integrated with low-burden formalisation and broad productivity gains
Privacy	Operationalise data minimisation, consent receipts, retention limits,	Privacy-preserving payments and analytics as the default architecture

	and independent audits	
Global links	Expand corridors with transparent total cost and reciprocal safeguards	Interoperable, low-cost cross-border retail and MSME payments

9 Governance and Financing Architecture

A mission of this duration needs institutional continuity with democratic accountability. A proposed Digital Payments for Development Council could convene the Ministry of Finance, RBI, MeitY, competition and consumer authorities, state governments, NPCI and other operators, banks, fintechs, telecom firms, civil-society organisations, and user representatives. RBI must retain independent regulatory authority; the council's role would be coordination, measurement, and public problem-solving, not operational interference.

Annual reporting should use a balanced scorecard across five layers: access, service quality, safety, market structure, and real-economy outcomes. Independent researchers should receive privacy-protected data through secure access arrangements. Major rule changes should include consultation, distributional-impact assessment, sandbox evidence where suitable, and post-implementation review.

Financing should distinguish the public-good core from competitive services. The core—standards, directory and switching functions, safety utilities, assisted access, and basic grievance infrastructure—may justify regulated cost sharing or explicit public support. Competitive applications and value-added services should have sustainable, transparent business models. Cross-subsidy should be disclosed, and incentives should pay for verified outcomes such as rural acceptance, accessibility, reliability, and fraud reduction rather than gross transaction counts.

10 Implementation, Monitoring, and Evaluation

The roadmap requires a delivery architecture that converts broad principles into assigned responsibilities, milestones, and verifiable outcomes. Table 4 presents a compact implementation matrix. It deliberately separates the authority responsible for setting or coordinating a standard from the regulated and commercial entities responsible for delivery. This distinction helps preserve regulatory independence and makes accountability visible.

Table 4: Priority implementation matrix

Priority	Lead and partners	Near-term deliverable	Evaluation measure
Universal access	RBI, banks, NPCI,	Interoperable feature-	Active-use gaps;

	telecom authorities, states	phone, offline, accessible, multilingual, and assisted-payment standards	channel success; distance and cost to assistance
Fraud response	RBI, Home Affairs, banks, apps, telecom firms, police	Single incident reference, rapid fund-tracing protocol, shared risk signals, and consistent liability communication	Loss per million transactions; freeze, refund, and final-resolution time
Operational resilience	RBI, operators, banks, cloud and telecom providers	Dependency maps, recovery standards, cross-sector simulations, and public incident taxonomy	Availability, recovery time, failure-tail percentiles, repeat incidents
Privacy and data use	MeitY, RBI, Data Protection Board, regulated entities	Sector-specific minimisation, retention, consent-receipt, audit, and contestability controls	Unauthorised-use incidents; audit findings; consent withdrawal and complaint outcomes
Competition	CCI, RBI, Ministry of Finance, system operators	Periodic market study across apps, acquiring, infrastructure, data, and cloud layers	Concentration, switching, multi-homing, entry, interoperability, and pricing indicators
MSME capability	Finance and MSME ministries, GSTN, banks, fintechs, states	Voluntary portable records linked to simple bookkeeping and suitable financial products	Adoption, approval quality, financing cost, productivity, and business survival
Crossborder-	RBI, partner	Selected interoperable	End-to-end cost, speed,

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payments	authorities, operators, foreign-exchange providers	corridors with transparent total price and shared safeguards	failure, complaint, and fraud rates

10.1 A balanced national scorecard

The scorecard should resist the temptation to compress performance into one celebratory index. A composite index is useful for communication, but it can permit improvement in transaction volume to offset deterioration in fraud losses or exclusion. A two-level system is preferable. The first level would publish a small set of headline outcomes under access, reliability, safety, affordability, privacy, competition, and productive use. The second would provide diagnostic indicators by participant, channel, region, and user group. Definitions, revisions, missing data, and known limitations should be published alongside the series.

Metrics should be normalised to meaningful denominators. Fraud should be shown relative to both transaction count and value; complaints relative to active users; downtime relative to peak and off-peak minutes; and merchant acceptance relative to active, not merely registered, outlets. Service quality should include the complete user journey, because an application can record successful initiation even when the receiving bank, reversal, or merchant confirmation fails. Where public reporting at participant level could create security concerns, regulators can publish bands, anonymised distributions, or delayed results while retaining detailed supervisory access.

10.2 Evaluation design

Policy pilots should specify a theory of change before launch. For example, a confirmation-of-payee feature is expected to reduce mistaken or impersonated transfers by presenting a verified recipient identity at the decision point. Evaluation should therefore measure comprehension, abandonment of legitimate payments, prevented loss, displacement to other fraud types, and differential effects for low-literacy users. Randomised rollout, stepped-wedge introduction, threshold-based designs, and matched comparisons can often produce stronger evidence than before-and-after totals.

Large infrastructure changes also require ex-post review. Each major intervention should state expected benefits, compliance and system costs, risks, distributional effects, and a review date. Independent evaluation should be commissioned when the implementing institution has a

strong reputational stake in the result. Results should be published even when an intervention has little effect. This learning orientation is particularly important because fraud adapts, interfaces change, and apparently successful controls can shift costs to vulnerable users.

10.3 Federal and local implementation

National rails operate through local institutions. States differ in connectivity, language, urbanisation, administrative capability, banking density, migration, and exposure to climate and disaster risks. State-level digital-payment plans should therefore diagnose local failure points within common national standards. District pilots can test assisted service, grievance camps, school and community literacy programmes, and business-correspondent viability. Panchayats, municipalities, self-help groups, consumer organisations, and disability-rights groups can identify problems that aggregate technical dashboards miss.

Local adaptation must not fragment interoperability or user rights. A person moving across states should encounter consistent liability rules, complaint references, accessibility expectations, and data protections. The appropriate model is national minimum standards with local delivery experimentation and transparent comparison. An annual federal learning forum could compare results, document implementation costs, and scale interventions with credible evidence.

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10.4 Sequencing and policy discipline

The order of reform matters. Expanding data-based credit before establishing record portability and contestability can lock firms into platforms. Eliminating physical or assisted channels before offline systems and recourse are dependable can deepen exclusion. Accelerating cross-border connections before domestic fraud coordination matures can widen the attack surface. The recommended sequence is therefore: protect essential access; improve observability and redress; harden resilience and privacy; integrate productive services; and then expand more complex domestic and international use cases.

Finally, the mission should retain the capacity to stop or redesign initiatives. Sunset clauses for pilots, regulatory review points, interoperable exit arrangements, and migration plans reduce the cost of correcting a poor design. Institutional willingness to revise a system in response to evidence is a strength, not a failure. A 2047 strategy must be durable in purpose but adaptable in instruments.

11 Research Agenda

Five evidence gaps deserve priority. First, repeated nationally representative surveys should measure independent and confident use, not merely account ownership. Second, linked but de-identified firm data should estimate whether digital-payment adoption raises productivity, survival, wages, and formal credit, with designs that address selection bias. Third, randomised and quasi-experimental studies should test fraud warnings, cooling periods, dispute procedures, and digital-literacy interventions. Fourth, competition research should examine multi-sided pricing, data advantages, vertical integration, and systemic dependencies. Fifth, lifecycle assessments should quantify the energy and material footprint of cash and alternative digital instruments. Pre-analysis plans, reproducible code, transparent null results, and privacy-preserving access would improve credibility.

12 Conclusion

India has already demonstrated that interoperable public rails can move digital payments from a premium service to everyday infrastructure. The strategic challenge to 2047 is qualitatively different from the challenge of initial adoption. Success should no longer be defined mainly by the number or value of transactions. It should be defined by whether every person and enterprise can transact safely and independently; whether failures are rare and remedies fast; whether data use is consensual and proportionate; whether markets remain innovative and contestable; and whether payment records translate into productivity, resilience, and genuine financial choice.

The proposed four-stage pathway universal access, trusted usage, productive integration, and global interoperability places these outcomes at the centre of Viksit Bharat 2047. Digital transactions can be a powerful general-purpose technology, but their gains depend on institutions. Governed as inclusive, resilient, privacy-preserving, and accountable infrastructure, they can expand both economic efficiency and human agency. Governed only for scale, they risk deepening existing divides. The decisive metric is therefore not how cashless India becomes, but how capable its citizens become.

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